

Claim 1

A shared Digital Subscriber Line (shared DSL) modem for connecting a plurality of Digital Subscriber Lines (DSLs) connected to individual client modems to a source of digital signals intended for the individual client modems comprising:

5 first means responsive to the source of digital signals for generating a first physical frame for an intended recipient client modem, said frame including a control channel for indicating which of the plurality of client modems connected via a DSL to the shared DSL modem is the intended recipient of the frame and the data field in the frame;

10 second means responsive to signals from the first means for generating a second physical frame identical to the first physical frame less the data field intended for the client modem identified in the control channel; and,

15 third means responsive to signals from the second means for contemporaneously transmitting the first physical frame over the DSL connected to the client modem identified in the control channel and transmitting the second physical frame to all of the other client modems.

Claim 2

The shared DSL modem set forth in claim 1 in which the third means includes:

20 a selector responsive to the control signal provided by the second means for directing the first physical frame from the first means to the DSL connected to the client modem identified in the control field and directing the second physical frame from the second means to all of the other DSLs.

Claim 3

The shared DSL modem set forth in claim 2 in which the third means includes for each DSL:

a transmission filter, a digital to analog converter and a line driver connected

5 to the selector.

Claim 4

The shared DSL modem set forth in claim 2 in which the third means includes:

10 a first and second transmission filter between the selector means and the first

and second means, respectively;

a line driver means for each DSL; and,

overlap addition means and digital to analog converter means connected
between each line driver and the selector means.

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Claim 5

The shared DSL modem set forth in claim 2 in which the third means includes:

20 a first and second digital to analog converter between the selector means and

the first and second means, respectively;

a line driver means for each DSL; and,

transmission filter means connected between each line driver and the selector
means.

25 Claim 6

A shared DSL modem as set forth in any one of claims 1-5 in which the second physical frame includes a low power signal.

5 Claim 7

A shared Digital Subscriber Line (shared DSL) modem for connecting a plurality of Digital Subscriber Lines (DSLs) connected to individual client modems to a source of digital signals intended for the individual client modems comprising:

10 first means responsive to the source of digital signals for generating a first physical frame for an intended recipient client modem including a control field identifying which of the plurality of client modems connected via a DSL to the shared DSL modem is the intended recipient of the frame and a data field;

15 second means responsive to the first means for preparing the first physical frame for transmission over a DSL;

third means responsive to the first means for generating a second physical frame which includes at least a control field identical to the control field in the first physical frame;

20 fourth means responsive to the third means for preparing the second physical frame for transmission over a DSL; and,

25 fifth means responsive to the second and fourth means for contemporaneously transmitting the prepared first physical frame from the second means over the DSL connected to the client modem identified in the control channel and transmitting the prepared second physical frame from the fourth means to all of the other client modems.

Claim 8

The shared DSL modem set forth in claim 7 in which the fifth means includes:

a selector responsive to the control field provided by the third means for directing the first physical frame from the second means to the DSL connected to the client modem identified in the control field and directing the second physical frame from the fourth means to all of the other DSLs.

Claim 9

The shared DSL modem set forth in claim 8 in which the fifth means includes for each DSL:

a transmission filter, a digital to analog converter and a line driver connected to the selector.

Claim 10

The shared DSL modem set forth in claim 8 in which the fifth means includes:

a first and second transmission filter between the selector means and the second and fourth means, respectively;

a line driver means for each DSL; and,
overlap addition means and digital to analog converter means connected between each line driver and the selector means.

Claim 11

The shared DSL modem set forth in claim 8 in which the fifth means

includes:

a first and second digital to analog converter between the selector means and the second and fourth means, respectively;

a line driver means for each DSL; and,

5 transmission filter means connected between each line driver and the selector means.

Claim 12

10 A shared DSL modem as set forth in any one of claims 7-11 in which the second physical frame includes low power signal components.

Claim 13

15 In a shared Digital Subscriber Line (shared DSL) modem, a method for connecting a plurality of Digital Subscriber Lines (DSLs) connected to individual client modems to a source of digital signals intended for the individual client modems comprising the steps:

20 generating a first physical frame for an intended recipient client modem including a control channel indicating which of the plurality of client modems connected via a DSL to the shared DSL modem is the intended recipient of the frame and a data field;

generating a second physical frame identical to the first physical frame less the data field intended for the client modem identified in the control channel; and,

25 contemporaneously transmitting the first physical frame over the DSL connected to the client modem identified in the control channel and transmitting the

second physical frame to all of the other client modems.

5 Claim 14

The method set forth in claim 13 in which a low power synchronization signal component is included in the generated second physical frame.